APPENDIX F

SITING AND DESIGN/OPERATING STANDARDS FOR CDL WASTE DISPOSAL FACILITIES

INTRODUCTION

This section presents siting and design/operating standards for special purpose and inert only waste landfills which handle one or more components of the CDL waste stream. These standards apply to both facilities available for use by the general public and private "own use" landfills.

SITING STANDARDS

The construction and operation of landfill facilities may result in impacts upon the natural and existing/future built environments. Sites which are proposed should by virtue of their setting and on-site features allow potential impacts to be reduced, eliminated or mitigated. There are many desirable features of an ideal site. Most of these would not, if absent, constitute a reason for rejecting a potential site. They may be made up for by other features of a site or they may simply indicate that a site is not perfect.

Siting standards allow sites to be analyzed so that their suitability as potential landfill facilities can be determined. Sites which are considered potentially suitable would then need to undergo a more site specific complete environmental analysis (SEPA process) prior to approval. Some standards are exclusionary (fatal flaw). A potential site which does not meet a particular exclusionary standard would require a variance (if possible) from the established standard for it to be considered further. Such sites are not preferred unless feasible alternatives are unavailable.

The potential impacts and requirements of the different types of landfill facilities which handle one or more components of the CDL waste stream vary significantly. Those of an inert waste landfill are substantially less than those of a special purpose landfill Therefore, the standards used to judge the suitability of a potential site will be different for each type of facility.

The siting standards which have been developed are to be used in reviewing and evaluating specific CDL landfill proposals in Clark County. They could also be used as the basis for a general county-wide CDL landfill siting search process.

Development of Siting Standards

Two main sources were used to develop the siting standards presented below. The first source was State of Washington requirements and standards as contained in State law Title 70 RCW, Chapter 70.95: Solid Waste Management - Reduction and Recycling, and the State Administrative Code Chapter 173-304 WAC: Minimum Functional Standards for Solid Waste Handling (MFS). The second source was the Sanitary Landfill Siting Criteria and Siting Process established in Clark County's 1985 Solid Waste Management Plan.

State Requirements and Standards

RCW 70.95.165 requires each potential disposal facility to be reviewed for conformance with the following list of criteria as set forth in the MFS:

a. geology
b. ground water
c. soil
d. flooding
e. surface water
f. slope
g. cover material
h. capacity
i. climatic factors
j. land use
k. toxic air emissions
l. other factors as determined by the Department of Ecology

The MFS (WAC 173-304) contains both locational and operational standards that address the above listed criteria. Locational standards are contained within WAC 173-304-130.

Clark County Sanitary Landfill Siting Criteria

Appendix A to Clark County's 1985 Solid Waste Management Plan established siting criteria which were developed for use in reviewing potential MMSW landfill proposals within the county. The Appendix A MMSW landfill siting criteria generally address all of the State's criteria discussed in the previous subsection.

The County's MMSW landfill siting criteria were separated into three basic areas of review: land use issues, environmental issues, and operational issues. Each review area was then separated into individual criterion as listed below:

Land Use Issues
- Zoning
- Land use
- Screening
- Wildlife considerations

Environmental Issues
- Geology
- Groundwater
- Surface water
- Flooding

Operational Issues
- Gas control
- Leachate collection
- Leachate disposal

- Slope
- Cover
- Capacity
- Access considerations
- Climatic factors

Following adoption of the County's Solid Waste Management Plan in 1985, the County embarked on a landfill siting process to develop a new MMSW landfill within the County. As part of that process, the above listed MMSW landfill criteria were further refined and assigned point values to establish a methodology that was then used to numerically rank 13 candidate MMSW landfill sites which had survived an initial site screening. That methodology and ranking is contained in the report "Clark County Sanitary Landfill Siting Study, Identification and Evaluation of 13 Potential Landfill Sites", April 1986. The criteria were then used to compare the sites relative to each other. As such, the modified criteria were used as comparative criteria not exclusionary criteria.

Siting Standards

In developing siting standards for special purpose and inert only waste landfills, the MFS locational standards and the County's MMSW landfill siting criteria as discussed above were reviewed and composited into a general set of siting standards. Each facility type was then separately reviewed against this set to exclude standards which would not apply .

For the purposes of developing the general set of siting standards, criteria categories were developed within the framework of the MFS locational standards. Individual locational standards are presented followed by discussion of a particular standard. Where applicable, the siting standards which apply to each facility type are then discussed.

A note regarding the MFS locational standards needs to be made. As discussed above, State law requires each potential disposal site to be reviewed in conformance with a list of 12 criteria. The MFS contains both operational and locational standards that address these criteria. Locational standards are contained within WAC 173-304-130 and apply to all MMSW landfills and limited (special) purpose landfills (however, limited purpose landfills can obtain relief from individual criteria if cause is shown). Inert waste landfills are only subject to the locational standard concerning unstable slopes. In developing the siting standards presented below, the County has developed certain siting standards for special (limited) purpose and inert only waste landfills which are more restrictive than the MFS. In addition, the County has also developed certain siting standards for special (limited) purpose landfills that are less restrictive than the MFS standards for MMSW landfills as is allowed by the MFS.

1. Geology

MFS standard: "No facility shall be located over a holocene fault, in subsidence areas, or on or adjacent to geologic features which could compromise the structural integrity of the facility." [WAC 173-304-130(2)(a)].

This locational standard recognizes potential geologic hazards including potentially active (earthquake producing) fault zones, active volcanic zones, landslide areas, and subsidence areas. These hazards pose a threat to the integrity of landfill environmental control systems. Mitigation is not usually possible. Normally such sites would be considered to be fatally flawed.

Special Purpose Landfills:
The MFS standard will constitute a fatal flaw.

Inert Only Landfills:
The MFS standard will not constitute a fatal flaw. Compatibility should be reviewed on a site specific basis.

2. Groundwater

MFS standard: "(i) No facility shall be located at a site where the bottom of the lowest liner is any less than ten feet above the seasonal high level of groundwater in the uppermost aquifer, or five feet when a hydraulic gradient control system or the equivalent has been installed to control ground water fluctuations;

"(ii) No landfill shall be located over a sole source aquifer; and

"(iii) No facility's active area shall be located closer than one thousand feet to a down-gradient drinking water supply well, in use and existing at the time of the county's adoption of the comprehensive solid waste management plan unless the owner or operator can show that the active area is no less than ninety days travel time hydraulically to the nearest down-gradient drinking water supply well in the uppermost useable aquifer." [WAC 173-304- 130(2)(b)(i),(ii),(iii)].

Groundwater flow systems are important with respect to site operations and development, groundwater quality protection, and on-site leachate containment. The potential for groundwater contamination increases or decreases based on the depth to groundwater beneath the site together with the permeability of the soils and materials between the site and groundwater, the rate of groundwater flow, the type of waste material being landfilled, and the design of the landfill itself. The primary concern is the potential for contamination of groundwater beneath the site and the subsequent movement of any contaminated groundwater to important aquifers or other valuable water resources.

It is more desirable for a landfill to be located in a groundwater discharge or flow area than a recharge area. Sites located over shallow water tables are less desirable than those located over deep water tables. The greater the distance a site is from existing, active drinking water wells, the more favorable the site would be. In addition, the number of wells in general proximity to a site should also be considered.

Special Purpose Landfills:
The MFS standard (i) and (iii) will constitute a fatal flaw. A proposed facility located over an area designated as a recharge area for a sole source aquifer or within a designated well head protection zone will also be fatally flawed.

Inert Only Landfills:
The MFS standard will not constitute a fatal flaw. Compatibility should be reviewed on a site specific basis.

3. Natural soils

MFS standard: "See WAC 173-304-400, such as WAC 173-304- 460(3)(c)(i), landfill liners." [WAC 173-304-130(2)(c)].

Soil and other on-site earth materials are used in landfill construction and operation for bottom liners, final cover, daily and intermediate cover, dikes, and roads. Different types of soils are required or are more suited for different applications. Fine-grained materials (silts and clays) are useful for liners and caps while coarse-grained materials (sands and gravels) are useful for gas venting, backfill for leachate collection systems, and road construction (dust generation). It is important to identify the soils which exist on a potential site as well as off-site sources that will satisfy the operational demands of the landfill not met by on-site soils. Sites which have sufficient on-site materials are more desirable than those that do not.

The permeability and stratigraphy of soils beneath a site and above the groundwater table are important considerations to prevent potential leachate migration. Low permeability soils (0.000001 cm/sec or less) retard water movement, which would help to contain and protect groundwater. High permeability soils are less desirable. The thickness and extent of the types of soil deposits and the order in which they are laid down are also important factors.

Generally, sites underlain by silt and clay soils are more desirable than sites underlain primarily by sand and gravel soils. Sites underlain by fractured bedrock are least desirable.

Special Purpose Landfills:
Not a fatal flaw. Proposed sites shall identify sources of materials needed to satisfy operational demands.

Inert Only Landfills:
Not a fatal flaw.

4. Flooding

MFS standard: "See WAC 173-304-400, such as WAC 173-304- 460(3)(d), landfill, floodplains." [WAC 173-304-130(2)(d)].

WAC 173-340-460(3)(d) requires that landfills located in a 100-year floodplain be designed to not restrict the flow of the base flood, not reduce the temporary water storage capacity of the floodplain, and prevent washout of the landfilled waste so as to protect the disposal facility and surrounding areas from damages caused by flooding.

Landfills located within the 100-year floodplain generally will require extensive flood protection measures. Normally such sites would be considered to be fatally flawed.

Special Purpose Landfills:
Proposed facilities located within a 100-year floodplain will be fatally flawed.

Inert Only Landfills:
The MFS standard will not constitute a fatal flaw. Compatibility should be reviewed on a site specific basis.

5. Surface Water

MFS standard: "No facility's active area shall be located within two hundred feet measured horizontally, of a stream, lake, pond, river, or salt water body, nor in any wetland nor any public land that is being

used by a public water system for watershed control for municipal drinking water purposes in accordance with WAC 248-54-660(4)." [WAC 173-304-130(2)(e)].

The distance of a site from a surface water body is an important consideration. Without careful control of design and operation, surface water bodies can be contaminated by surface water runoff or discharge of contaminated groundwater. In general, sites located away from surface water bodies are more desirable than sites located in close proximity to water bodies.

Special Purpose Landfills:
The MFS standard will constitute a fatal flaw.

Inert Only Landfills:
The MFS standard will not constitute a fatal flaw. Compatibility should be reviewed on a site specific basis.

6. Slope

MFS standard: "No facility's active area shall be located on any hill whose slope is unstable." [WAC 173-304-130(2)(f)].

The MFS prohibits the location of a facility's active area on any unstable slopes. This restriction is also covered under WAC 173-304-130(2)(a) - Geology (see item 1 above). Slope stability is important from both environmental and operational considerations. Landslides or earth movements can compromise the integrity of environmental control systems and interrupt landfill operations.

Unstable slopes may be naturally or artificially caused. This standard applies to naturally occurring unstable slopes. It would not apply as a fatal flaw for unstable slopes which are the result of artificial means (e.g. - unstable side slopes as the result of excavation activity) that can be corrected through slope stabilization practices. Such a site would require slope stabilization prior to fill activity.

In addition, the effect of slope (topography) can also contribute positively or negatively to the development of a site. Areas of gentle slope are generally desirable because site access and construction procedures are generally favorable. Areas of moderate slopes may provide for mitigation of visual impacts because of relief provided by adjacent surface topography, but site access and construction/operation of the facility may require special considerations. Areas of steep slopes generally will result in access and construction/operational difficulties. In addition, areas of steep slopes have a greater potential for slope stability problems.

Special Purpose Landfills:
The MFS standard will constitute a fatal flaw.

Inert Only Landfills:
The MFS standard will constitute a fatal flaw.

7. Cover Material

MFS standard: "See WAC 173-304-400, such as WAC 173-304-460 (3)(e), landfills, closure;". [WAC 173-304-130(2)(g)].

The MFS contains requirements for daily, intermediate and final cover. Different types of soils are used or are more suited for different applications. It is important to identify the soils which exist on a potential site as well as off-site sources that will satisfy the operational demands of the landfill not met by on-site soils. Sites which have adequate supplies of cover material on-site are more desirable than sites that require imported materials.

This item is also covered under WAC 173-304-130(2)(c) - Natural Soils. The discussion for item 3 above applies.

8. Capacity

MFS standard: "See WAC 173-304-400, such as WAC 173-304-460, Landfilling standards, (for standards that vary according to capacity);". [WAC 173-304-130(2)(h)].

The MFS has several mandatory design and operating standards related to site size (e.g. - requirements for liner and leachate collection systems, gas collection, scales, number of operating personnel). In addition, site specific development requirements such as buffers, roads, environmental control systems, and other facility design considerations will determine the capacity of a landfill that can be developed at any site.

An evaluation of a site's capacity is based on the total number of years of site life. In general, sites that have large capacities (more than ten years of capacity) are preferred to those with small capacities. In addition, sites that are proposed with significant recycling operations based on site waste separation and recycling activities extend the capacity of the site and are more favorable than sites proposed for fill only. This would be applicable to special purpose landfills. It is desirable to limit the number and size of these types of sites to meet the County's long term disposal needs. Having many small capacity sites or many large capacity sites is undesirable. Inert only waste landfill proposals should be evaluated on an individual basis. Small capacity sites should be limited to accepting only inert wastes.

Some special purpose landfills may be proposed as an "own use" landfill (e.g. - Boise Cascade's Rufener landfill). These sites should be evaluated on a specific industry needs basis.

9. Climatic Factors

MFS standard: "See WAC 173-304-400 such as WAC 173-304- 460(3) landfill standards, (for standards applicable to arid climates);". [WAC 173-304-130(2)(i)].

This MFS requirement refers to standards applicable to arid climates having less than twelve inches of annual rainfall. Annual rainfall exceeds twelve inches in all areas of the County.

However, there are differences in climate within Clark County. Average annual rainfall ranges from approximately 40 inches in the southwestern part of the County to 120 inches in the northeastern corner. Rainfall entering a landfill can eventually cause leachate. Sites located in dryer parts of the County (under 60 inches of rainfall per year) are more desirable than those located in wetter areas.

10. Land Use

MFS standard: "No facility shall be located:

> "(i) Within ten thousand feet of any airport runway currently used by turbojet aircraft or five thousand feet of any airport runway currently used by only piston-type aircraft unless a waiver is granted by the federal aviation administration. This requirement is only applicable where such a facility is used for disposing of garbage such that a bird hazard to aircraft would be created;
>
> "(ii) In areas designated by the United States Fish and Wildlife Service or the department of game as critical habitat for endangered or threatened species of plants, fish, or wildlife;
>
> "(iii) So that the active area is any closer than one hundred feet to the facility property line for land zoned as nonresidential, except that the active area may be no closer than two hundred and fifty feet to the property line of adjacent land zoned as residential existing at the time of the county's adoption of the comprehensive solid waste management plan;
>
> "(iv) So as to be at variance with any locally-adopted land use plan or zoning requirement unless otherwise provided by local law or ordinance; and
>
> "(v) So that the active area is any closer than one thousand feet to any state or national park." [WAC 173-304-130(2)(j)].

Each of these MFS restrictions noted above would be considered a fatal flaw for MMSW landfills. Certain of these are not considered applicable to facilities only accepting certain components of the CDL waste stream. These include (i) and, under certain circumstances, modification to (iii).

In addition to the MFS restrictions, there are other siting issues and concerns related to land use not contained in the MFS. Under current Clark County Code (CCC) Chapter 18.410, landfills are permitted land uses in any zone within the unincorporated county area subject to the issuance of a solid waste conditional use permit. CCC 18.410 contains criteria which provide general direction regarding land use and other factors to be considered when evaluating the suitability of a proposed landfill site. They do not provide final direction as to specifics for evaluation of potential impacts or possible mitigations that may be imposed to minimize or eliminate potential impacts. Appendix A to the County's 1985 Solid Waste Plan examined these issues and established siting criteria for reviewing MMSW landfill proposals. These criteria were further refined in the 1986 Clark County Sanitary Landfill Siting Study. The land use criteria used in that study were as follows:

- airport proximity
- adjacent land use
- future adjacent site use
- loss of forest and agricultural resources
- access routes
- utilities and services
- aesthetics

The above listed criteria, with the exception of airport proximity, would also be applicable to special purpose and inert only waste landfill proposals. In addition to these and the MFS criteria, the following additional criteria would also be applicable:

- existing land use
- archaeological and historical resources
- special overlay zones

The above described criteria are discussed below.

A. Airports: The MFS prohibition of siting a solid waste landfill within 10,000 feet of an airport runway being used by turbojet aircraft or 5,000 feet of a runway being used by piston-type aircraft is applicable to facilities accepting garbage (putrescible wastes). Those wastes can only be disposed at MMSW landfills. Facilities disposing of only CDL waste components would attract few, if any, birds such that a bird hazard would not be created. This standard is not considered applicable to CDL facilities.

Special Purpose Landfills:
The MFS standard is not applicable.

Inert Only Landfills:
The MFS standard is not applicable.

B. Critical Habitat: The MFS restricts siting a landfill in an area designated as a critical habitat area by the U.S. Fish and Wildlife Service or State Department of Wildlife. This standard will be considered a fatal flaw for a proposed site.

In addition, the nature of habitat on or adjacent to a potential site is an important consideration because it is an indication of the extent of potential impacts on wildlife. All landfill sites cause some disruption of the biological environment. Proposed sites where construction and operation could significantly impact high value habitat supporting threatened or endangered species are undesirable. In addition, sites that support unique species of plants or animals or sites located in close proximity to important migration routes, such as streams used by anadromous fishes, are less desirable than those that are not.

Special Purpose Landfills:
The MFS standard will constitute a fatal flaw.

Inert Only Landfills:
The MFS standard will constitute a fatal flaw.

C. Buffer Zone: The MFS stipulates that the active (fill) area of a MMSW landfill can be no closer than 100 feet to the facility property line for adjacent land zoned as nonresidential and 250 feet for land zoned as residential. It would be preferable to maintain the MMSW MFS buffer distances if practical. However, this setback may not be possible especially in the case where the waste material is being used as fill to reclaim previously disturbed land. If the MMSW buffer distances can not be maintained they could be relaxed as site conditions warrant. It is preferable, however, to maintain a minimum setback distance of 50 feet to the facility property line for property zoned as nonresidential and 100 feet for property zoned as residential. These setback distances would not apply to situations where inert waste materials were being used for backfill. Inert fill situations should be reviewed on a site specific basis.

Special Purpose Landfills:
The MFS standard as modified is preferred.

Inert Only Landfills:
The MFS standard is not applicable. Compatibility should be reviewed on a site specific basis.

D. Zoning: This MFS restriction is discussed under F and G below.

E. State or National Parks: The MFS stipulates that the active area of a landfill can be located no closer than 1000 feet to any state or national park. This restriction will be considered a fatal flaw except for inert waste fills used for reclaiming land on a site specific basis.

Special Purpose Landfills:
The MFS standard will constitute a fatal flaw.

Inert Only Landfills:
Compatibility should be reviewed on a site specific basis.

F. Existing Land Use: Sites where existing land uses are more compatible with the facility are more desirable.

Appendix A to Clark County's 1985 Solid Waste Management Plan reviewed land use compatibility issues for use in reviewing potential MMSW landfill proposals in the county. Those compatibility issues would generally also be applicable to CDL facilities. These land use issues are discussed below.

Certain land uses are more compatible with landfill operations than others. To evaluate that compatibility, a two-step process was used: (1) evaluation of the overall land use commitments made in the Clark County Comprehensive Plan; and (2) evaluation of those designated uses for their degree of compatibility with landfill siting. The land use designations on the 1980 Clark County Comprehensive Plan Map were grouped according to their compatibility with landfill siting -- least potential conflict, moderate potential conflict, and most potential conflict.

The following land use designations are included within each category:

- Least potential conflict
  - Forest (20-acre minimum)
  - Agriculture (20-acre minimum)
  - Heavy industrial
- Moderate potential conflict
  - Residential rural estate (5 to 10 acres)
  - Residential rural farm (10 to 20 acres)
- Most potential conflict
  - Rural residential (2.5 to 5 acres)
  - Suburban residential
  - Residential (all urban)
  - Commercial

- Industrial park, business park
- Light manufacturing
- Marine industrial
- Airports
- Heritage areas and wildlife refuges
- Transportation corridors
- Future urban areas (which may include agriculturally designated lands)

Least Potential Conflict

These land use designations provide the least potential for direct human impact. Forest and agricultural areas are rural, are generally the least developed areas of the County, and provide the best opportunity for isolation. Development in these areas would avoid most high-use or high-density areas. Conversion of forest or agricultural land to a landfill would eliminate that use in the short term. The relative acreages that would be removed are not expected to have a significant impact on the County's timber or agricultural base, and these uses could be reinstated at the site after reclamation.

Industrial uses are generally compatible with landfill operations. Such uses are intentionally isolated or buffered from residential or commercial areas because of noise, truck activity, dust, and other features associated with high activity and heavy equipment use. Many of the concerns that are offered on landfill siting are similar to industrial operations, and the same types of buffering and mitigations are often required.

Generally, adequate industrial land has been designated for existing and future uses so that conversion of some of these lands to a landfill should have minimal impact. Area-specific and site-specific evaluations should be performed, however, because some industrial lands have unique or valuable features that must be protected. For example, there are localized industrial sites within the County adjacent to the Columbia River shoreline. These marine industrial areas are irreplaceable, unique in the County, and should be preserved for water-related or water-dependent land uses.

Moderate Potential Conflict

Residential rural estate and rural farm designations include land uses that are generally large parcels, which allow more buffering to be established between ownerships and land uses than do denser developments. These land use categories do not provide the isolation of farm or agricultural designations, and moderate potential impact may be expected where rural residential development exists. These impacts may be real (e.g., traffic, dust) or perceived (decrease in property values). Mitigations are often readily available in these areas because of the distance between potentially conflicting land uses. More specific site reviews will be required for areas that are more, or less, developed than the existing Comprehensive Plan indicates.

Most Potential Conflict

Urban, future urban, and semiurban residential areas, commercial areas, light manufacturing, industrial and business parks, airports, heritage areas, wildlife areas, and transportation corridors provide the most potential conflicts to siting landfills. These areas are characterized by considerable human use and activity, verified hazards, and potential conflicts that may be difficult to mitigate. Potential impacts are likely to be more numerous and public response greater because of the greater number of citizens

affected. Land acquisition costs may be greater in these areas because they are planned for intensive development.

Developed Areas

The density of development is a useful factor for predicting the potential for adverse impact from a new landfill. Generally, the more densely developed an area, the greater the potential for impacts on adjacent land uses. The developed land map illustrates the areas in Clark County that are, or are planned to be developed. It would be desirable to locate a new landfill in a less developed area to minimize impacts on adjacent uses.

Secondary Compatibility Evaluations

As the generalized areas of most compatibility and least compatibility are identified, an additional step in land use compatibility can occur. Within an area designated as moderate potential conflict, a substantial portion of the land may not be developed or adjacent existing uses would be compatible with a landfill (such as a wrecking yard). Conversely, an area that has been designated, according to the Comprehensive Plan, as having least potential conflict may actually have an incompatible existing adjacent use (such as a nursing home). To address these potential conflicts, the following uses and their respective levels of compatibility are provided:

Least Compatible Existing Land Uses

- Existing single-family residential development of 10 homes or greater on 10 acres or less, within 1,320 feet of the boundary of the landfill site
- Existing mobile home park or multifamily development of 10 or more units within 1,320 feet of the boundary of the landfill site
- Existing hospitals, medical clinics, nursing homes, or day-care centers within 1,320 feet of the landfill site boundary, or other facilities with special populations that could be considered high risk
- Existing public or private schools within 1,320 feet of the landfill site boundary
- Existing places of public assembly, including churches and indoor auditoriums, within 1,320 feet of a landfill site boundary
- Existing motels or hotels within 1,320 feet of the landfill site boundary
- Existing propeller aircraft airports within 5,000 feet of landfill site boundary, and jet-engine airports within 10,000 feet
- Existing eating and drinking establishments within 1,320 feet of landfill site boundary
- Existing wildlife refuges within 1,320 feet of landfill site boundary
- Existing food stores within 1,320 feet of landfill site boundary

Less Compatible

- Existing commercial uses within 1,000 feet of landfill site boundary (except as noted below)
- Existing office uses or business park development within 1,000 feet of landfill site boundary
- Existing industrial park use within 1,000 feet of landfill site boundary
- Existing light industrial use within 1,000 feet of landfill site boundary (except as noted below)
- Existing agricultural use producing goods for human consumption within 1,000 feet of landfill site boundary
- Existing heavy industrial site within 500 feet of landfill site boundary

Most Compatible

Adjacent to:

- Existing or proposed sewage treatment plants
- Other existing landfill sites
- Existing surface mines or quarries
- Existing forest or tree farms
- Existing agriculture, including nurseries and greenhouses, for produce or ornamentals not intended for human consumption
- Existing power and utility rights-of-way, including railroad tracks and facilities but excluding passenger stations
- Existing rifle ranges
- Existing auto racing facilities
- Existing auto wrecking yards
- Processing of the following products within existing established facilities:
  - Junk, rags, paper, or metal salvage, storage or processing
  - Rubber treatment or reclaiming plant
  - Slaughterhouse

- Distillation of bones
- Fat rendering
- Incinerator or reduction of garbage, offal, dead animals, or refuse
- Animal or bone black processing
- Concrete mixing plant
- Crusher, stone, or rock

- Manufacture of:

  - Concrete products
  - Cement, lime, gypsum, or plaster of paris
  - Cellulose and cellulose products
  - Insecticide and fungicide
  - Paint, oil (linseed), shellac, turpentine, lacquer or varnish
  - Phenol or phenol products
  - Roofing paper or shingles, or asphalt
  - Acid
  - Explosives (and storage)
  - Ammonia
  - Anti-knock compounds for gasoline
  - Carborundum (abrasives)

In addition, the proposed use of the site after completion of landfilling activities should also be considered for compatibility considerations and feasibility, and should be consistent with current zoning or any applicable re-zone contracts.

The following criteria should be used :

- Existing land use on the property must be compatible with the proposed facility, or the existing use must be relinquished or relocated.

- The ultimate use of the site outlined in the reclamation plan must be consistent with the long-term development plan of the area as identified in the County Comprehensive Plan.

- The suitability of the site for the proposed ultimate use must be practical and feasible.

- A time period for reclamation must be described and should be reasonably consistent with the ultimate proposed use.

Special Purpose Landfills:
The above criteria apply.

Inert Only Landfills:
The above criteria apply.

G. Adjacent Land Use: The type of existing and future adjacent or surrounding land uses should be considered in evaluating site suitability based on compatibility considerations. Compatible land uses are discussed in Appendix A (see item F above). Adjacent land uses could preclude development of the site

if they are incompatible with the landfill operation. Traffic, noise, odors, air quality, vibration, visual affects, and nuisances, should all be evaluated. The following criterion should be used:

- Factors included under environmental concerns, such as traffic, noise, odors, air quality, vibration, visual affects, and nuisances, must be evaluated to determine actual versus perceived impacts. It must be determined if impacts by the landfill can be adequately mitigated to allow reasonable use of adjacent areas.

Special Purpose Landfills:
The above criterion applies.

Inert Only Landfills:
The above criterion applies.

H. Loss of Forest or Agricultural Resources: Input related to the MMSW landfill siting process identified the preservation of forest and agricultural land as a desirable action. A site that has no impact on prime agricultural or forest lands is more desirable than a site that would remove prime agricultural or forest land from production.

I. Transportation Factors: Transportation to and from a disposal site will have an impact on noise, safety, air quality, and the general condition of the roadways themselves. Sites located near roads that can support the increased levels of service without major modifications, or access onto roads planned for major improvements to support increased levels of service in the near future are preferable to sites that cannot. Sites that provide direct access onto or are in close proximity to major arterials are preferable to those that do not. Sites with primary access routes through non-residential and/or low density land use areas are preferred. Sites with primary access routes through residential,highly populated land use areas, or sensitive receptor areas (schools, hospitals) are undesirable. Sites where truck traffic will interfere with local traffic patterns are also undesirable.

It is desirable for a site to be located close to major arterials that are capable of carrying high weight traffic levels. Sites that are located further away from major arterials are less desirable than those that are closely located due to slower travel times and probable impacts on local roads and areas adjacent to the access route. It is also desirable for a site to be located closer to the major centers of waste generation.

The following criterion should be used:

- A site which can not accommodate the type and volume of traffic generated by the proposed facility by existing or proposed roadway systems at the site, along the primary access routes to the site, and at respective intersections, will be considered fatally flawed.

Special Purpose Landfills:
The criterion will constitute a fatal flaw.

Inert Only Landfills:
The criterion will not constitute a fatal flaw. Compatibility should be reviewed on a site specific basis.

J. Utilities and Services: A site will likely require power, water, telephone, and various other utilities for proper operation of the facility. Sites that have the potential to generate leachate will need to be capable of providing for the proper disposal and treatment of leachate. Utility needs will be facility specific and must be determined for each facility on an individual basis. Sites which do not have the necessary utilities or acceptable alternatives available would be considered fatally flawed.

K. Aesthetics: Screening may be necessary to restrict the site, sounds or other operations of a facility from potential receptors, either in the surrounding area or for passers-by if the site is near a major transportation corridor. The degree of screening required will be a function of several elements, including topography and existing vegetation of the area, and the distance to and type of adjacent receptors.

The existence of natural landscape buffers or topography to mitigate these impacts is a desirable feature of a site. If natural features are not present, then the ability to create such barriers should be considered. Sites which are unable to mitigate aesthetic impacts through either natural or artificial means are less desirable than those sites which can mitigate.

L. Cultural Resources: A site with no cultural, historical or archaeological resources on-site is preferable. Archaeological and historical resources range from sites on the National Register to areas identified as archaeologically important to Native Americans. Sites which would require the destruction of important cultural resources would constitute a fatal flaw.

M. Special Overlay Zones: Sites which are located within a conservation or special environmental overlay district where landfill activities are prohibited would be considered fatally flawed.

11. Toxic Air Emissions

MFS standard: "See WAC 173-304-400 such as WAC 173-304-460 (2)(b), landfill performance standards." [WAC 173-304-130(2)(k)].

This MFS standard primarily addresses design and operational issues related to landfill gas control (e.g. - gas control limits and emission standards) and does not directly relate to site characteristics before landfilling.

Landfilled wastes containing organic matter will decompose over time producing landfill gas as a decomposition byproduct. Landfill gas typically is composed of nearly equal parts of carbon dioxide and methane with trace quantities of other gases present. Methane is of concern due to its explosion potential. Gases may move through soil and have the potential to accumulate in confined or semi-confined spaces. Trace gases are usually of concern for their odor causing potential.

Gas generation from CDL waste landfills is generally low relative to MMSW landfills. No gas would be produced from an inert waste landfill.

Certain site characteristics can be used to assess the potential for underground gas migration. Sites with low permeability soils at and adjacent to the site and having no structures within 1000 feet are more desirable than sites with high permeability soils and structures adjacent to the landfill.

Site Review and Permitting Process

A number of factors have to be considered when evaluating the suitability of a proposed site. These would include compliance with the siting standards set forth above, and consideration of County or City code requirements and other factors.

The siting standards allow proposed sites to be analyzed so that their suitability as potential landfill facilities can be determined. Sites which are not fatally flawed and are considered potentially suitable would then need to undergo a more site specific complete environmental analysis (SEPA process). Some of the siting standards would be more completely evaluated through this process (in particular the land use standards). For new disposal facilities or significant expansions of existing facilities, an environmental impact statement would likely be required.

There are two major permits that any new landfill or expansion of an existing facility (not covered under existing permits) would need. These are a County (or City if applicable) conditional use/solid waste zoning permit (land use permit) and a solid waste disposal site permit (operations permit) issued by the Southwest Washington Health District. These are briefly discussed below.

County Conditional Use Permit

Under Clark County Code Chapter 18.410, landfills are permitted land uses in any zone within the unincorporated county area subject to the issuance of a solid waste conditional use permit. The County through its solid waste zoning/conditional use permit process has retained the authority to determine the suitability of a proposed landfill facility on a site-by-site basis.

A County conditional use permit can only be approved after the approval authority (in this case the County Planning Commission) makes the following four findings:

1. That the use will not prevent the orderly and reasonable use and development of surrounding properties or of properties in adjacent zones;

2. That all public or private utilities necessary for the use are available, and the roads serving the use are adequate to accommodate the type and extent of vehicular traffic;

3 That the reclamation plan submitted by the applicant for the proposed use and any expansion clearly demonstrates that the site as reclaimed may be utilized for uses permitted within the zoning district in which it is located; and

4. That the proposed use and any expansion does not impair or impede the realization of the objective of the Comprehensive Plan, and it would not be detrimental to the public interest to grant such proposed use.

The Planning Commission's decision on the conditional use permit is final unless appealed to the County Board of Commissioners. Additional details on information that needs to be submitted in favor of a conditional use application can be found in Clark County Code Chapter 18.410.

Solid Waste Disposal Site Permit

The disposal site permit is issued by the Southwest Washington Health District (SWWHD) under the authority established in RCW 70.95. This permit is also required under Clark County Code (CCC) Chapter 24.12. The general purpose of this permit is to regulate the construction and operation of a landfill. The SWWHD permit cannot be issued until the necessary land use permit (County conditional use/solid waste zoning permit) is approved. In addition, in accordance with CCC 24.12.350, the County Solid Waste Advisory Commission (SWAC) must hold a public hearing and make an advisory recommendation to the SWWHD before the final permit can be issued. In making its recommendation, SWAC considers a number of criteria and findings as outlined in CCC 24.12.110.

The information submitted in support of the SWWHD permit must be consistent with the conditional use permit. For practical purposes, much of the information will be the same as provided for the conditional use permit and the two processes could be run somewhat concurrently.

DESIGN/OPERATING STANDARDS

The MFS contains minimum design and operating standards for landfills under the following WAC sections:

1. WAC 173-304-405, General facility requirements.
2. WAC 173-304-407, General closure and post-closure requirements.
3. WAC 173-304-460, Landfill standards.
4. WAC 173-304-461, Inert waste and demolition waste landfilling facility requirements.
5. WAC 173-304-462, Woodwaste landfilling facility requirements.
6. WAC 173-304-467, Financial assurance for public facilities.
7. WAC 173-304-468, Financial assurance for private landfill disposal facilities.
8. WAC 173-304-490, Groundwater monitoring requirements.
9. WAC 173-304-700, Variances.

Like the siting standards discussed previously, the minimum design and operating standards also vary for each facility type. Those of an inert waste landfill are substantially less than those required for a special purpose landfill. Regarding design and operating standards for limited (special) purpose landfills, WAC 173-304-460(5) requires limited (special) purpose landfills to meet the same standards as MMSW landfills, however, relief from individual requirements can be obtained.

In developing minimum design and operating standards for each facility type, the MFS standards were reviewed and composited into a general set of minimum standards. For the purposes of developing the general set of standards, categories were developed within the framework of the MFS requirements for MMSW landfills. Each facility type was then separately reviewed against this set to exclude standards which would not apply to a particular facility type. Like the siting standards which were developed, certain of the minimum design and operating standards developed are more restrictive than the MFS. Likewise, certain of the standards for limited (special) purpose landfills are less restrictive than the MFS standards for MMSW landfills as is allowed by the MFS.

The majority of these standards would be reviewed through the Southwest Washington Health District's process for issuance of a disposal site permit. Where submittals are required they would generally be

approved as part of that process. In addition, in most instances the Health District would also be the lead enforcement agency for determining compliance with operating standards.

1. **WAC 173-304-405, General Facility Requirements**

This section of the MFS sets general requirements for all types of facilities. The Section 405 MFS requirements are briefly summarized below. Refer to Section 405 of the MFS for more information.

a. An approved plan of operation is required to be developed and followed (WAC 173-304-405(2)).

b. Daily operating records are required to be kept and maintained (WAC 173-304-405(3)).

c. An annual report is required to be submitted (WAC 173-304- 405(4)).

d. Routine inspections are required and an inspection log is required to be maintained (WAC 173-304-405(5)).

e. Upon facility closure, certain items are to be recorded with the county auditor (WAC 173-304-405(6)).

f. Compliance is required with all state and local requirements (WAC 173-304-405(7)).

Modification to MFS requirements
Item (c) requires an annual monitoring report be submitted. This item should be modified such that facilities would submit in addition to the annual report, at least quarterly monitoring reports covering the same information. For facilities accepting more than 5,000 cubic yards per month, monthly reports would be required.

Applicability
The general requirements,as modified, would be applicable to all CDL facilities.

2. **WAC 173-304-407, General Closure and Post-closure Requirements.**

This section of the MFS sets both general closure and post-closure requirements for all types of facilities. Under the MFS, the closure requirements are applicable to all types of CDL facilities. The post-closure requirements are applicable to limited (special) purpose landfills. Refer to Section 407 of the MFS for more information.

Modification to MFS requirements
The need for post-closure requirements for inert only waste landfills will be determined on a specific facility basis.

Applicability
These general requirements,as modified, would be applicable to all CDL facilities.

3. WAC 173-304-460, Landfill Standards

This section of the MFS sets standards for MMSW and limited (special) purpose landfills. The Section 460 MFS requirements are briefly summarized below. Refer to Section 460 MFS of the for more information.

a. Sets ground water quality standards (WAC 173-304-460(2)(a)).

b. Sets air quality and toxic emission standards (WAC 173-304- 460(2)(b)).

c. Sets surface water quality run-off standards (WAC 173-304- 460(2)(c)).

d. Minimizes liquids into landfills by requiring daily cover, prohibits the acceptance of free liquids, and requires storm water run-on and run-off control facilities (WAC 173-304-460(3)(a)).

e. Requires leachate collection and treatment systems (WAC 173-304 460(3)(b)).

f. Requires a bottom liner (WAC 173-304-460(3)(c)).

g. Requires landfills sited in 100-year floodplains to meet certain design requirements (WAC 173-304-460(3)(d)).

h. Sets final cover requirements (WAC 173-304-460(3)(e)).

i. Requires gas control systems (WAC 173-304-460(3)(f)).

j. Sets other miscellaneous requirements such as access control, environmental monitoring, scale facilities, employee facilities, sign requirements, on-site fire protection, vector control, adequate unloading areas, on-site road access, and communication systems (WAC 173-304-460(3)(g)).

k. Requires operating plan (WAC 173-304-460(4)(a)).

l. Sets certain operational standards such as requires dust control, restricts open burning, requires litter control, prohibits scavenging, sets personnel requirements, requires vector control, and requires reserve equipment (WAC 173-304-460(4)(b)).

m. Requires boundary posts (WAC 173-304-460(4)(c)).

n. Sets compaction and daily cover requirements (WAC 173-304- 460(4)(d)).

o. Requires maintenance of environmental monitoring systems (WAC 173-304-460(4)(e)).

p. Requires recycling facilities (WAC 173-304-460(4)(f)).

q. Prohibits acceptance of dangerous wastes (WAC 173-304- 460(4)(g)).

Modification to MFS requirements

Item (f) requires use of a liner. Special purpose landfills will be required to have a liner. Several

alternative designs are possible. It is preferred that a composite liner consisting of a synthetic liner underlain by recompacted clay or other material meeting the permeability requirement of 0.000001 cm/sec be used. The small landfill designation will not be applicable.

Item (g) sets design requirements for facilities in the 100-year floodplain. A special purpose landfill is not allowed to be sited in the 100-year floodplain; see siting standards.

Item (h) sets final cover requirements. A final top cover of at least six inches of soil is required to be placed over a two foot low permeability or liner cover. The six inch soil requirement will be increased to a minimum of two feet.

Item (j) sets several miscellaneous requirements. One of these is the provision of scale facilities or other equivalent method of measuring the incoming waste for landfills which accept more than 5,000 cubic yards of waste per year. Scale facilities are preferred.

Item (p) requires facilities accepting household solid wastes from the public to have recycling facilities. This will not be applicable since these facilities will not be accepting household solid wastes.

In addition to these modifications, there are several other provisions which a special purpose landfill would be required to meet. These include QA/QC activities during construction, maintenance of as-built records, control of off-site road mud, random load checking program, certified operators, and visual berms and/or landscaping.

Independent quality assurance and quality control activities by qualified inspectors would be required during the construction of any major environmental control system (e.g. liner systems, final closure, etc.). This activity would be arranged through the Southwest Washington Health District which would be reimbursed for the costs of this activity directly by the project proponent.

As-built documentation should be maintained and kept current for all major components of the landfill during its construction, operation, and closure.

Facilities will be required to control the tracking of mud from vehicles to off-site roads used by the general public. This can be accomplished with a wheel wash facility or other equivalent methods.

A random load checking program should be instituted at a facility in addition to other regular load checking activities. Under this program, a certain number of loads per week or month (depending on the size of the facility) would be required to discharge its load so that the entire contents could be examined for unacceptable wastes. A rule of thumb that could be used is that one load per thousand cubic yards would be examined. Other load checking activities would include the facility operator having its equipment and gate personnel trained in the identification of hazardous and unacceptable wastes.

At least one state-certified operator will be required to be on-site or on-call during the facility's operating hours. This requirement is contained in WAC 173-300.

Facilities would be required to have visual berms/fencing and/or landscaping shields to minimize the amount of off-site visual impacts. It is recognized that it may not be possible to mitigate all off-site visual impacts during the operation of a facility.

Applicability
These general requirements,as modified, would be applicable to all special purpose landfills.

4. WAC 173-304-461, Inert Waste and Demolition Waste Landfilling Facility Requirements.

This section of the MFS sets standards for inert waste landfills. The Section 461 MFS requirements are briefly summarized below. Refer to Section 461 of the MFS for more information.

a. Requires records of amounts of waste to be recorded (WAC 173- 304-461(3)).

b. Requires dust control measures to be employed (WAC 173-304- 461(4)).

c. Requires intermediate cover as necessary (WAC 173-304-461(5)).

d. Requires closure performance and final soil cover requirements (WAC 173-304-461(6)).

e. Requires controlled access (WAC 173-304-461(10)).

Modification to MFS requirements

Inert only waste landfills will be required to meet the Section 461 MFS requirements. Item (d) requires a minimum of one foot of final soil cover be applied. This will be increased to a minimum of two feet. In addition, inert waste only landfills will require some type of load checking program, proper storm water drainage control in accordance with County grading code requirements, and require control of off-site road mud.

Applicability
These general requirements,as modified, would be applicable to all inert only waste landfills.

5. WAC 173-304-467, Financial Assurance for Public Facilities and WAC 173-304-468, Financial Assurance for Private Landfill Disposal Facilities

These sections of the MFS set closure and post-closure financial assurance requirements for facilities open to the public (WAC 173-304-467) and private "own use" landfill facilities (WAC 173-304-468). These requirements are applicable to special purpose landfills. Refer to Sections 467 and 468 of the MFS for more information.

Modification to MFS requirements/Applicability
The financial assurance requirements will be reviewed on a specific needs basis for inert only waste landfills.

6. WAC 173-304-490, Groundwater Monitoring Requirements.

This section of the MFS sets ground water monitoring requirements. According to the MFS, ground water monitoring is required only at MMSW and limited (special) purpose landfills. Refer to Section 490 of the MFS for more information.

Modification to MFS requirements/Applicability

Ground water monitoring facilities meeting the MFS requirements will be required at all special waste landfills. Monitoring at inert only waste landfills will be reviewed on a specific needs basis. In general, ground water monitoring will not be required at inert only waste facilities.

7. WAC 173-304-700, Variances

This section of the MFS sets requirements for landfill owners/operators to request a variance from any requirement of the MFS. Refer to Section 700 MFS for more information. In addition, the Department of Ecology has also issued a technical information memorandum (TIM No. 88-1) that provides guidelines and procedures for reviewing variance requests.

Modification to MFS requirements/Applicability

Variance requests will need to be reviewed on a specific case-by-case basis.